

The Atopic Dermatitis Spectrum

State of the Art Clinical Management

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Atopic Dermatitis

Objectives:

1. Be able to describe treatment strategies for moderate to severe atopic dermatitis

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INTRACTABLE PEDIATRIC ATOPIC DERMATITIS CHECKLIST

Name: _____ Date: _____
Date of Birth: _____ MD: _____
Informant: _____
Age Atopic Dermatitis Dx: _____
Year Round/Seasonal: _____
Other Medical Problems: _____
of Hospitalizations: _____

I. General Principles:

GENERAL SKIN CARE: Bathing (duration, frequency, soap used) _____
Moisturization methods _____
Compliance w/ advice or meds _____
Clothing (cotton/wool/irritant) _____
Comments: _____

SLEEPING PATTERNS: Difficulty falling asleep _____
Frequent night awakening 2° to scratching _____
Daytime fatigue _____
Comments: _____

PSYCHOSOCIAL: Marital status/problems _____
Financial status/parental employment _____
1° caretaker of child _____
Number of children/ sibling relationships _____
Other health problems in child & siblings _____
Day care/ school problems _____
Conflict between child-parent/child's motivations for Rx _____
Comments: _____

II. Hypersensitivity:

FOOD ALLERGY: Bottle (type of formula)/breastfed (mother's diet/supplements) _____
Solid food introduction and sequence _____
Food sensitivity _____
Comments: _____

AEROALLERGY: Carpet _____
Beddings _____
Pets _____
Cigarette smoke _____
Comments: _____

CONTACT ALLERGY: Aggravated by steroid/ moisturizer use _____
Known nickel/contact allergy _____
Comments: _____ Consider patch _____

III. Infectious Causes:

BACTERIAL SUPERINFECTION: Honey-colored crusting, pustules, weeping _____

Comments: _____ skin & nasal cultures from child & caretaker; _____ empiric antibiotics/intranasal Bactroban

ECZEMA HERPETICUM: Fever, lymphadenopathy, vesicles, erosions _____

Comments: _____ consider Tzanck prep, culture, acyclovir _____

DERMATOPHYTE INFECTION: T. corporis, T. capitis, T. pedis etc. _____

Comments: _____ consider fungal culture, KOH prep _____

IV: Immunodeficiency:

WISKOTT-ALDRICH SYNDROME: Male _____
Petechiae, epistaxis, bloody diarrhea or hx of intracranial bleeding _____
Recurrent otitis media _____

Comments: _____ Dx: decreased platelets, increased bleeding time, IgA & IgE, decreased IgM, nl IgG _____

HYPERIMMUNOGLOBULIN E SYNDROME: Recurrent infections of skin, lower respiratory tract, ears, eyes & sinuses _____
Coarse facial features _____

Comments: _____ Dx: persistent IgE > 2000 IU/ml; leukocyte chemotactic test _____

NETHERTON SYNDROME: Poor hair growth (trichorrhexis invaginata/nodosa) _____
Ichthyosis linearis circumflexa (double-edged scale) _____

Comments: _____ Dx: microscopic examination of hair (bamboo stalk appearance) _____

CHRONIC GRANULOMATOUS DISEASE: Male: _____
Recurrent infections, rhinitis, stomatitis, blepharitis, keratoconjunctivitis, pneumonia, diarrhea, visceral abscess _____
Hospitalizations _____

Comments: _____ Dx: oxidative burst analysis _____

INFECTIVE DERMATITIS W/HTLV-1: Staph/Strep super infection resistant to treatment _____
Caribbean/Japanese origin Location: _____

Comments: _____ Consider HTLV-1 antibodies, PCR _____

HIV INFECTION: Child/parent risk factors/known HIV + status _____
Recurrent opportunistic infections/failure to thrive _____

Comments: _____ Dx: HIV-1 antibodies/CD4 count/viral load _____

BIOTIN DEFICIENCY: Intertriginous involvement with alopecia and recurrent candidal infections _____

Comments: _____ Dx: PABA levels (nl 3.5-12.0 n mol/min/ml) _____

V. Other:

PLANS

LABS: _____

TREATMENT: _____

RETURN APPOINTMENT _____ **M.D. Signature** _____

forms/intractable pediatric atopic dermatitis checklist

Workup for Intractable AD

I. General Principles:

A. GENERAL SKIN CARE COMPLIANCE

- I. bathing (duration, frequency, soap used)
- II. moisturization methods
- III. compliance w/ advice or meds
- IV. clothing (cotton/wool)

B. SLEEPING PATTERNS:

- I. difficulty falling asleep
- II. daytime fatigue
- III. frequent night awakening 2° to scratching

C. PSYCHOSOCIAL:

- I. marital status/problems
- II. financial status/parental employment
- III. 1° caretaker of child
- IV. number of children/ sibling relationships
- V. other health problems in child & siblings
- VI. day care/ school problems
- VII. child affect
- VIII. child-parent conflict/child's motivations for Rx

II. Hypersensitivity

A. FOOD ALLERGY:

Bottle (formula)/breastfed)

Solid food introduction & sequence

Food hypersensitivity

-majority react to ≤ 3 food on challenge

B. AEROALLERGY:

Carpet

Beddings

Pets

Cigarette smoke

C. CONTACT ALLERGY:

Aggravated by steroid/ moisturizer use

Known nickel/contact allergy

III. Infectious Causes

A. BACTERIAL SUPERINFECTION:

Honey-colored crusting, pustules, weeping

Dx: consider skin and nasal cultures from child & caretaker

Empiric antibiotics/intranasal Bactroban

B. ECZEMA HERPETICUM:

Fever, lymphadenopathy, vesicles, erosions

Dx: consider Tzanck prep, culture, acyclovir

C. DERMATOPHYTE INFECTION:

Scaly rash or nail changes

Dx: consider fungal culture, KOH prep

- *Malassezia* (Pityrosporum) *sympodialis* common in seborrheic areas
- IgE antibodies vs. *M. sympodialis* in AD patients, mostly head and neck distribution
- Decrease AD severity in patients treated with antifungal agents¹

Back O, Scheynius A, Johansson SG: Ketoconazole in atopic dermatitis:therapeutic response is correlated with decrease in serum IgE. *Arch Dermatol Res* 1995; 287:448-451.

IV: Immunodeficiency:

WISKOTT-ALDRICH SYNDROME: Male; Infections

Petechiae, epistaxis, bloody diarrhea or + hx of intracranial bleeding

Dx: ↓ platelets, ↑ bleeding time, IgA & IgE; ↓ IgM, nl IgG

HYPERIMMUNOGLOBULIN E SYNDROME: coarse facial features

Recurrent infections of skin, lower respiratory tract, ears, eyes, sinuses

Dx: persistent IgE > 2000 IU/mL; leukocyte chemotactic test

NETHERTON SYNDROME: poor hair growth (trichorrhexis invaginata/nodosa)

ichthyosis linearis circumflexa (double-edged scale)

Dx: microscopic examination of hair (bamboo stalk appearance)

CHRONIC GRANULOMATOUS DISEASE: male

Recurrent infections, stomatitis, blepharitis, keratoconjunctivitis, pneumonia, diarrhea, visceral abscesses

Dx: oxidative burst analysis

INFECTIVE DERMATITIS W/HTLV-1: Caribbean/Japanese origin

Staph/Strep superinfection resistant to treatment

Dx: consider HTLV-1 antibodies, PCR

HIV INFECTION: child/parent risk factors/known HIV + status

Recurrent opportunistic infections/failure to thrive

Dx: HIV-1 antibodies/CD4 count/viral load

Principles of Therapy

- **GENERAL SUPPORTIVE CARE:**
 - Skin Hydration and Barrier therapy
 - Emollients
 - Baths
 - Wet Wraps
 - Avoidance of irritants and specific allergens
- **GET THE DISEASE UNDER CONTROL!**
 - Anti-Inflammatory meds:
 - Strength based on disease severity
 - Stronger steroids for short bursts
- **KEEP IT UNDER CONTROL**
 - Steroid Sparing Agents
 - Immunomodulators (pimecrolimus, tacrolimus)
 - Immunodevices (atopiclair)
 - Proactive Treatment

Skin Hydration and Barrier Therapy

Emollients

- Improve skin barrier function
- Reduce susceptibility to irritants
- Adding emollients to regimen strengthens failing intercellular fillagrin elements by delaying uncoiling

Why Moisturizers are Important

Regular use of topical CS can lead to disruption of epidermal barrier function by inhibiting epidermal synthesis of fatty acids*

- alleviated by application of mixture of ceramides, free fatty acids & cholesterol**
- Support regular use of appropriate emollients

Darsow et al. ETFAD/EADV eczema task force 2009 position paper on diagnosis and treatment of atopic dermatitis. Journal compilation @2009 European Academy of Dermatology and Venereology 2010, 24, 317-328

* Jensen JM, Pfeiffer S, Witt M, et al. Different effects of pimecrolimus and betamethasone on the skin barrier in patients with atopic dermatitis. J Allergy Clin Immunol 2009;124(3 Suppl 2):R19–28.

** Kao JS, Fluhr JW, Man MQ, et al. Short-term glucocorticoid treatment compromises both permeability barrier homeostasis and stratum corneum integrity:inhibition of epidermal lipid synthesis accounts for functional abnormalities.J Invest Dermatol 2003;120(3):456–64.

Ingredients contributing to effective moisturizers

- Humectants (glycerol): attract and hold water in the skin
- Occlusives (petrolatum): retard evaporation but needs to be applied on damp/wet skin
- Emollients (lanolin): lubricate the stratum corneum

Emollients and their Vehicle

**Effectiveness of basic therapy is directly linked to patient adherence
therefore, cosmetic acceptance of an emollient is crucial**

Ointment

**For thick, fissured, lichenified skin
Less preservative
Aesthetically undesirable**

Cream

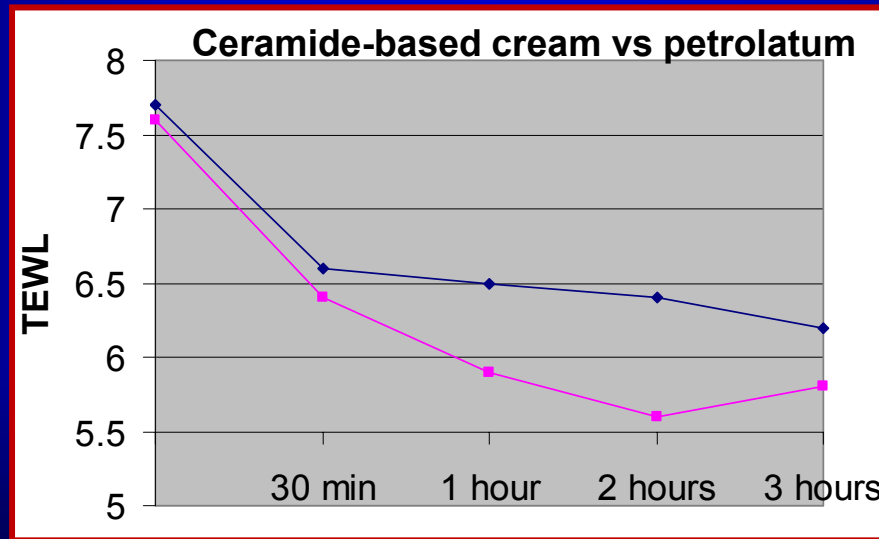
**For moist intertriginous areas
Requires preservatives that may be sensitizing & irritating**

Solution, gel, spray, mousse

**Aesthetically elegant especially on the scalp
Contain alcohol & propylene glycol that burn & irritate**

Emollients

- Urea
 - Ammonium Lactate (Lac-Hydrin 5% or 12% Cream or lotion)
- Ceramide-Dominant lipid based emolient
 - CeraVe Cream
 - Epiceram (Rx with ceramides, cholesterol, free fatty acids 3-1-1)
 - TriCeram Cream



Chamlin SL. Ceramide-Dominant, Barrier-Repair Lipids Improve Childhood Atopic Dermatitis. Archives of Dermatology 2001;137:8

Cleansing & Skin Hydration

- Baths
- Wet Wraps
- Antiseptics
- Antibiotics

Baths

- **Soak for 20 minutes**
 - With or without oatmeal or baking soda
 - Quickly clean with mild wash
- Or
- Quick 5 min bath**
- **Drip dry**
- **Apply occlusive emollient immediately**

Soaps and detergents

Mild soaps/cleansers: Vaniderm, Dove, Basis, Neutrogena, Aveeno, Purpose, Cetaphil

Antibacterial soaps: Clorhexidine, Triclosan

Detergents:

- Use liquid rather than powder**
- Add a second rinse cycle**

Bleach Baths

31 AD pediatric patients
S Aureus eradication: Cephalexin x 14 days

**Intranasal mupirocin (5 days/mo) &
sodium hypochlorite baths (0.005%)
twice weekly x 3 mos**

**Intranasal Petrolatum ointment
& plain water baths twice
weekly x 3 mos**

- **EASI scores reduced after 1 month ($P = .17$) & 3 months ($P = .004$) compared to placebo**
- **Only the body parts submerged during bathing improved but not the head and neck area**
- **Unclear whether or not the clinical effect of bleach baths can be explained by S. aureus reduction or astringent effects of bleach baths**

Wet Wrap Therapy – An Acute crisis intervention

After bath targeted therapy for acute flare-ups

- 1) Apply with emollient or steroids
- 2) 2 layers of “roll” gauze (wet then dry)

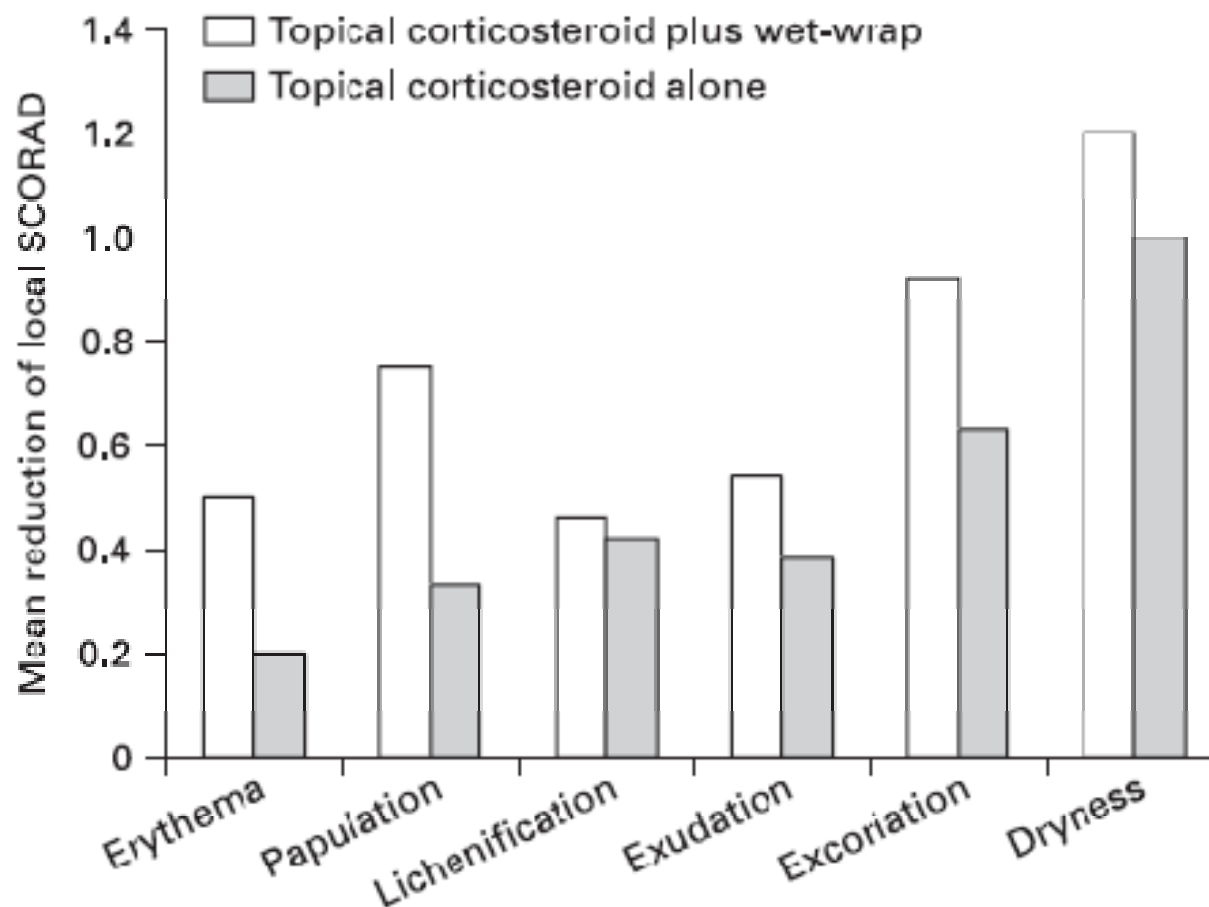
Benefits

- Barrier to scratching
- Decrease itch-scratch cycle
- Increase steroid penetration
- Allow rapid healing of excoriated lesions
- Decreased *S. Aureaus* colonization

Evidence-based critical review of wet wrap therapy in children (grade C recommendation)

- Wet wrap therapy using cream or ointment is an efficacious **short-term treatment** in children with severe &/or refractory AD
- Wet wrap dressings with diluted **topical corticosteroids is a more efficacious** short-term treatment in children with severe and/or refractory AD than with emollients only
- Wet wrap dressings with diluted topical corticosteroids for **up to 14 days is a safe treatment in children** with severe and/or refractory AD, with temporary systemic bioactivity of the corticosteroids as the only reported serious side-effect
- Lowering the absolute amount of applied topical corticosteroid to once daily & further product dilution can reduce the risk of systemic bioactivity

Wrap Therapy (Left/Right)



Antiseptic

- May be used for patients with frequent bacterial infection
- Whole body or critical regions only
- Triclosan (2,4,4'-trichloro-2'-hydroxydiphenyl ether) 1-2%
 - antibacterial activity vs. *S aureus*, *Klebsiella pneumonia*, *Proteus**
 - Resistance rarely observed**
 - pHisoderm Antibacterial Skin Cleanser, Dial® Liquid Soap, Softsoap® Antibacterial Liquid Hand Soap, Clearasil® Daily Face Wash,
- Chlorhexidine gluconate 0.5-1%
 - Hibiclens®, Hex-A-Clens®

*Gloor M, Becker A, Wasik B, et al. [Triclosan, a topical dermatologic agent. In vitro- and in vivo studies on the effectiveness of a new preparation in the New German Formulary]. *Hautarzt* 2002;53(11):724–9 [in German]

**Ledder RG, Gilbert P, Willis C, et al. Effects of chronic triclosan exposure upon the antimicrobial susceptibility of 40 ex-situ environmental and human isolates. *J Appl Microbiol* 2006;100(5):1132–40

Concerns

1. *S aureus* eradication on atopic skin is only temporary
2. Systemic absorption & possible long-term side effects with extensive use in severely compromised skin barrier in AD must be considered

Conclusion: addition of antiseptics to emollient or baths on a regular basis independent of clinical infection is reserved for:

1. special manifestations of AD (eg, weepy-type AD)
2. special circumstances (eg, mothers of small babies)
3. elevated risk for systemic infection (eg, in-dwelling catheters or chronic wounds)

Topical astringent for oozing & weeping lesions

- Drying effect**
- Helps eliminate local infection**
- Aluminum Acetate**
 - Use as moist compress**

Topical mupirocin

- Use for localized impetiginized lesions, systemic antibiotics is more practical for extensive skin infection
- Treatment for nasal carriage
- Of note, antiinflammatory therapy alone, with either a topical corticosteroid or calcineurin inhibitor, has been shown to improve AD & reduce *S. aureus* colonization

Use of Oral Antibiotics in AD

- Overt infection (pustules, vesicles, furuncles)
- Superinfection (serous crusting, oozing)
- AD recalcitrant to other topical therapies
- Antibiotics
 - Cefadroxil (duricef)
 - Cephalexin (keflex)
 - Cefdinir (omnicef)
 - Trimethoprim/sulfamethoxazole
 - Tetracyclin

Strategies in Use of Topical Corticosteroids

- Fluticasone propionate (Cutivate) & mometasone furoate (Elocon) are effective **once a day** * (increase compliance)
- Fluticasone propionate: shown to be safe & effective in children ≥ 3 mo. , **even on face & significant body surface area for up to 1 mo****
- Fluticasone propionate: children ≥ 3 mo. show that **long term maintenance 2x a wk is safe & effective*****
- FDA Approved for
 - ≥ 3 mos: desonide & fluticasone cream
 - ≥ 1 yr: alclometasone
 - ≥ 2 yrs : mometasone

*Lebwohl M. Int J Dermatol 38:604-606, 1999

**Friedlander SF et al. J Am Acad Dermatol 46:387-393, 2002

***Berth-Jones. Br Med J 326:1367-1372, 2003

***Hanifin J . Br J Dermatol 147:528-537, 2002

Topical Calcineurin Inhibitors

- Specially useful in areas prone to atrophy: eyelid, perioral, genital, axilla, inguinal
- For long term use
- Black box warning
- Proactive Tx has been shown to be safe & effective for up to one year in reducing flares
- Anti-inflammatory potency
 - 0.1% TC ~ intermediate strength CS >1% PC

When Is It Time for Systemic Therapies?

- Moderate/Severe AD
 - Failure topical agents
 - Recurrent complications (i.e.infections)

Oral Corticosteroids

- Recognized as generally effective
- Associated with dramatic rebounds
- Reserved for crisis management
 - Need strategy for long term maintenance
 - Taper the dosage
 - Intensify skin care

Other Immunosuppressive Therapies for Atopic Dermatitis

- **Oral Calcineurin Inhibitors**
 - Cyclosporin A
 - Tacrolimus (FK506)
 - Pimecrolimus
- **Mycophenolate mofetil**
- **Azathioprine**

Beers MH, Berkow R, eds. *The Merck Manual of Diagnosis and Therapy*. 17th ed. Rahway, NJ: Merck Research Labs; 1999:816-919.

Leung DYM. *J Allergy Clin Immunol*. 2000;105:860-876.

Cyclosporin

- Rapid 2-3 week response
- 93% good or excellent clearance
- Limited duration (2 years) without expected renal compromise
 - Monitor LFTs, u/a, lipids, Mg, K
 - Renal toxicity, increased BP
- Rapid rebound in 50%
 - 10% with sustained remission >6 months
- 1-year study of CsA (5 mg/kg/day) in children showed no significant differences between intermittent or continuous treatment in efficacy or safety*

Cyclosporin A

- 3-5 mg/kg/d for 6 weeks
 - Children as young as 22 months responded to 2.5 mg/kg/day *
- Decrease 1 mg/kg/d every 2 weeks until 1 mg/kg/d
- Increase interval by 1 day every 2 weeks
- Try to d/c after 3-6 months
- Add other therapy- topical CS or UV

Sidbury & Hanifin. Clin Exp Dermatol 25:559, 2000

Bunikowski R, Staab D, Kussebi F, et al: Low-dose cyclosporin A microemulsion in children with severe atopic dermatitis: clinical and immunological effects. *Pediatr Allergy Immunol* 2001; 12:216-223

Cyclosporine Check List

Name:

Cyclosporin Dose:

Date Started:

Test	Date/Comments	Date/Comments
BP		
CBC/Diff		
CMP q 2 wks x 3 mo then q mo		
Creatinine x 3 prior to start		
FBS		
HbA1C		
LFT		
K		
Mg		
Cyclosporin level		

Mycophenelate Mofetil (Celcept)

- Inhibits inosine monophosphate dehydrogenase
 - Blocks purine synthesis and DNA production
- 4-6 week response, 10-90% good or excellent clearance
- No long term data in children
 - Monitor CBC, LFTs
 - Myelosuppression, liver and GI toxicity
- Sustained remission after 8 weeks
 - 85% with sustained remission >5 months

Phototherapy

- **Apoptosis of inflammatory cells, inhibit langerhan cells, alter cytokine production, antimicrobial effect**
- **Natural sunlight- beneficial but avoid sunburn & excessive sweating**
- **Broadband UV: UVA + UVB (290-400 nm)**
- **Narrowband UVB (311-313 nm)**
- **UVA 1**
- **PUVA**
- **3-5 x a week for 12 weeks**

Difficult Itch

Sedating Agents P.M. Control

- Hydroxyzine at 2mg/kg q hs (H1)
- Doxepin (tricyclic antidepressant) at 1mg/kg q hs (H1/H2)
- Paroxetine (Paxil ®) at 10mg q hs
 - Serotonin type 3 receptors (SSRI)
 - Occasional postural hypotension
- Mirtazapine/Clonidine (central alpha-2 inhibitor)
 - No data in children
 - Lasts only 4-6 weeks



Relief

- **Pramoxine:**
 - Hydrating bases (Prax Lotion)
 - Menthol & pramoxine (Sarna Ultra)
- **What not to give: strong sensitizer**
 - Benadryl Cream
 - Zonolon Cream

Emotional Factors increase pruritus

- Atopics respond to stress, frustration, embarrassment with increase pruritus & scratching
- Scratching may be associated with secondary gain or just a habit
- Psychologic evaluation & counseling if with emotional triggers or psychologic problems
- Behavioral modification/distraction therapy, relaxation biofeedback

Disease Management of AD: An updated practice parameter. Annals of Allergy 93:3 S1-S21, Sept 2004

Schmid-Ott G et al. Different expression of cytokine & membrane molecules by circ lymph on acute mental stress in patients with AD in comparison to healthy controls. J Allergy Clin Immunol 108:455-462,2001

Schmid-Ott G et al. Levels of circ CD8+ T lymphocytes, NK cells & eosinophils increase upon acute psychological stress in patient with AD. J Allergy Clin Immunol 107:171-177,2001

Melin L et al . Behavioral tx of scratching in patients with AD. Br J Dermatol 115:467-474, 1986

Proactive treatment with Topical Corticosteroids (previously involved but normal-appearing)

376 moderate to severe AD (12-65 yrs)

Stabilization: Fluticasone cream 0.05% or Ointment 0.005%

Maintenance: 2 successive evenings weekly

Vehicle

Fluticasone cream

5.8 x less likely to flare
 $p < 0.001$

Fluticasone ointment

1.9 x less likely to flare
 $p = 0.010$

No difference in adverse events

Berth-Jones J, Damstra RJ, Golsch S, et al: Twice weekly fluticasone propionate added to emollient maintenance treatment to reduce risk of relapse in atopic dermatitis :randomized doubleblind, parallel group study. *Br Med J*. 2003;326:1367-1372

Peserico A, Stadtler G, Sebastian M, et al: Reduction of relapse of atopic dermatitis with methylprednisolone aceponate cream twice weekly in addition to maintenance treatment with emollient : a multicenter, randomized, double blind controlled study. *Br J Dermatol* 2008; 158:801-807

Proactive treatment with Topical Corticosteroids (previously involved but normal-appearing)

249 moderate to severe AD >12 yrs)

Stabilization: Methyl-prednisolone aceponate 0.1% cream

Maintenance: 2 successive evenings weekly (n=221)

Emollient

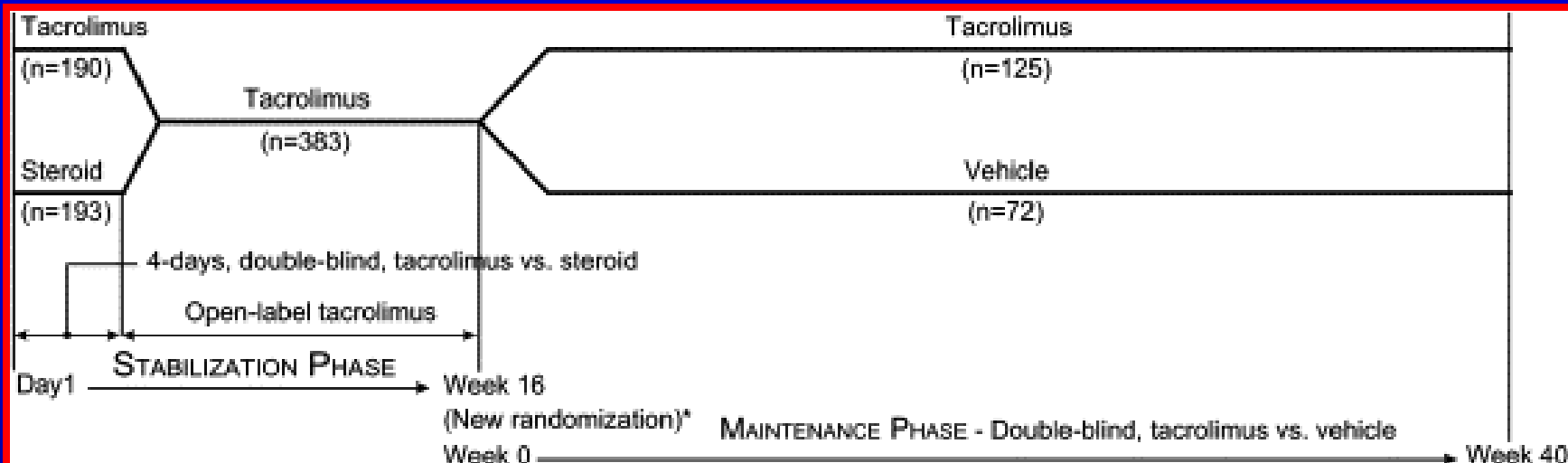
Methyl-prednisolone

3.5 x less likely to flare $p=0.0001$

No difference in adverse events

Peserico A, Stadtler G, Sebastian M, et al: Reduction of relapse of atopic dermatitis with methylprednisolone aceponate cream twice weekly in addition to maintenance treatment with emollient a multicenter, randomized double-blind, controlled study. *Br J Dermatol* 2008; 158:801-807.

Proactive treatment with Tacrolimus



*New randomization of Stabilization Phase patients eligible
(clear or almost clear) for continuation into Maintenance Phase

STABILIZATION PHASE TREATMENTS

Tacrolimus ointment: 0.1% (Adult patients)
0.03% (Pediatric patients)
Steroid: 0.1% triamcinolone ointment (Adult patients)
0.05% alclometasone ointment (Pediatric patients)

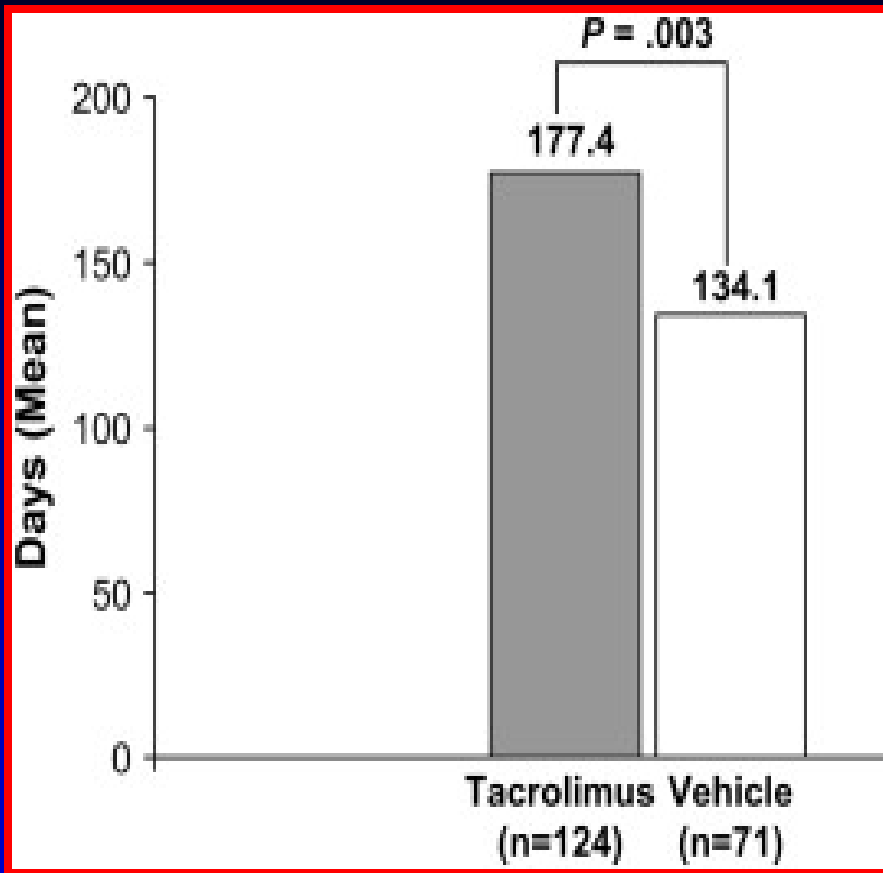
Application: BID

MAINTENANCE PHASE TREATMENTS

Tacrolimus ointment: 0.1% (Adult patients)
0.03% (Pediatric patients)
Vehicle (Adult and pediatric patients)

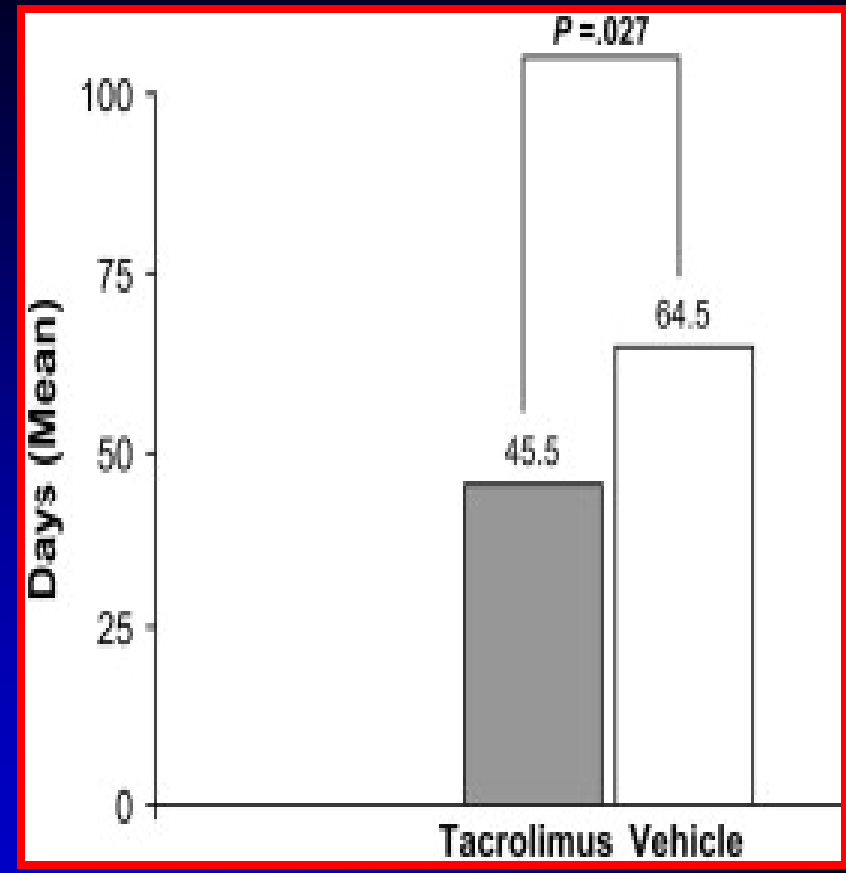
Application: Once daily, 3 times per week

Breneman D et al. Intermittent therapy for flare prevention and long-term disease control in stabilized atopic dermatitis: A randomized comparison of 3-times-weekly applications of tacrolimus ointment versus vehicle. JAAD. 58 (6) Pages 990-999, June 2008,



Flare-free days

Patients on TCO had significantly more flare-free treatment days compared with vehicle ($P = .003$)



Number of disease relapse days

Patients on TCO had significantly fewer disease relapse days compared with vehicle ($P = .027$)

Prevention (pregnancy & after birth)

- **Maternal avoidance**
- **Neonatal avoidance**
- **Breast feeding**
- **Stop the Atopic March**

Maternal Dietary Restriction

Current evidence does not support a major role for maternal dietary restrictions during pregnancy or lactation

Greer FR, Sicherer SH, Burks W and the Committee on Nutrition and Section on Allergy and Immunology. Effects of Early Nutritional Interventions on the Development of Atopic Disease in Infants & Children: The Role of Maternal Dietary Restriction, Breastfeeding, Timing of Introduction of Complementary Foods, and Hydrolyzed Formulas PEDIATRICS January 2008;121(1):183-191

Breastfeeding

- Evidence that breastfeeding for at least 4 months, compared with intact cow milk formula **prevents or delays the occurrence of atopic dermatitis**, cow milk allergy, and wheezing in early childhood.

Formula

- In studies of infants at high risk of atopy & not exclusively breastfed for 4- 6 mo, there is modest evidence that the **onset of atopic disease may be delayed or prevented by the use of hydrolyzed formulas** compared with formula made with intact cow milk protein, **particularly for atopic dermatitis**

Summary

Effects of Early Nutritional Interventions on the Development of Atopic Disease

- (-) No major role for maternal dietary restrictions during pregnancy or lactation
- (++) Breastfeeding for at least 4 months prevents or delays AD, cow milk allergy & wheezing in early childhood
- (+) Modest evidence that the onset of atopic disease may be delayed or prevented by use of hydrolyzed formulas
- (-) Little evidence that delaying introduction of complementary foods beyond 4-6 mos. prevents atopic disease

Other Strategies

Unna boots

- Compression dressing, usually made of cotton
- Zinc oxide paste applied uniformly to bandage
 - ease skin irritation
 - keeps area moist
 - promotes healing within wound sites
- Zinc oxide paste is superior to gelatins in other dressings, because it does not harden or cake
- Some Unna Boots also contain calamine lotion, glycerin, acacia, castor oil, white petrolatum



Silver-impregnated clothing

- Reduce staphylococcal colonization, improved clinical parameters and reduced topical corticosteroid use in AD

Gauger A, Fischer S, Mempel M, et al. Efficacy and functionality of silver-coated textiles in patients with atopic eczema. *J Eur Acad Dermatol Venereol* 2006; 20(5):534–41.

Koller DY, Halmerbauer G, Bock A, et al. Action of a silk fabric treated with AEGIS in children with atopic dermatitis: a 3-month trial. *Pediatr Allergy Immunol* 2007;18(4):335–8.

Stinco G, Piccirillo F, Valent F. A randomized double-blind study to investigate the clinical efficacy of adding a non-migrating antimicrobial to a special silk fabric in the treatment of atopic dermatitis. *Dermatology* 2008;217(3):191–5.

Tar

- **Help control itching, redness & scaling when all else fails**
- **Not aesthetically pleasing, may smell & stain**
- **Compounded concoction includes**
 - **10% LCD (liquid coal tar distillate)**
 - **5% Salicylic Acid**
 - **3% Lactic Acid**
 - **in ointment base such as Aquaphor**
 - **baths (Balnetar)**

Probiotics & Atopic Dermatitis in Children

Reference	Result	Comments
Meta-analysis Michail SK, Stolfi A, Johnson T, et al: <i>Ann Allergy Asthma Immunol</i> 2008; 101:508-516	Modest role in moderate-severe AD Atopic Dermatitis Severity Index score (mean change from baseline, -3.01; 95% CI; P = 0.01)	Duration, age, type of probiotic used did not affect outcome
Meta-analysis Lee J, Seto D, Bielory L: <i>J Allergy Clin Immunol</i> 2008; 121:116-121.e111	Current evidence is more convincing for probiotic in prevention rather than treatment of pediatric AD	Prevention
Randomized, DBPC trial Kopp MV, Hennemuth I, Heinzmann A, et al: <i>Pediatrics</i> 2008; 121:e850-e856	Lactobacillus GG during pregnancy and early infancy neither reduced the incidence of AD nor altered the severity of AD	Increased rate of recurrent wheezing bronchitis
Cochrane Database Syst Rev Boyle RJ, Bath-Hextall FJ, Leonardi-Bee J, et al. 2008:CD006135	Concluded that probiotics are not an effective treatment for eczema in children	Probiotic Tx carries a small risk of adverse events

Vitamin D and Atopic Dermatitis

- Vit D may play a role in regulation of antimicrobial peptides in keratinocytes
- 48% of patients (0-18 yrs) with asthma, atopic dermatitis, &/or food allergy had insufficient (<30 ng/mL) levels of serum 25- hydroxyvitamin D*

Reference	Results
Erkkola M, et al. Clin Exp Allergy 2009;39(6):875–82	Lower frequency of atopic disease in the children of Mothers with higher intake of Vit D
Back O, Blomquist HK, et al. Acta Derm Venereol 2009;89(1):28–32	Questionnaire based survey: Atopic manifestations were more prevalent in group with higher intake of vitamin D3 in birth cohort of 123 children
Sidbury R, Sullivan AF, Thadhani RI, et al. Br J Dermatol 2008;159(1):245–7	DBPC in children with AD treated with 1000 IU/d of vitamin D for 1 mo. in winter: 4/5 treated (vs 1/6 placebo) had significant improvement in baseline score

Larger trials with vitamin D in AD are ongoing

Erkkola M, et al. Maternal vitamin D Intake during pregnancy is inversely associated with asthma and allergic rhinitis in 5-year-old children. Clin ExpAllergy 2009;39(6):875–82

Back O, Blomquist HK, et al. Does vitamin D intake during infancy promote the development of atopic allergy? Acta Derm Venereol 2009;89(1):28–32

Sidbury R, et al. Randomized controlled trial of vitamin D supplementation for winter-related atopic dermatitis in Boston: a pilot study. Br J Dermatol 2008;159(1):245–7

*Searing DA, Murphy J,. Vitamin D levels in children with asthma, atopic dermatitis, and food allergy. J Allergy Clin Immunol 2010;125(2):AB44

Monoclonal anti-IgE (omalizumab)

Reference	Subjects	Results
Vigo PG, Girgis KR, Pfuetze BL, et al: Efficacy of anti-IgE therapy in patients with atopic dermatitis. <i>J Am Acad Dermatol</i> 2006; 55:168-170.	Patients with AD including children treated for asthma with SQ Omalizumab	Clinical benefit
Krathen RA, Hsu S: Failure of omalizumab for treatment of sever adult atopic dermatitis. <i>J Am Acad Dermatol</i> 20052005; 53:338-340	Adults with severe AD and significantly elevated serum IgE	No benefit as mono therapy
Lane JE, Cheyney JM, Lane TN, et al. Treatment of recalcitrant atopic dermatitis with omalizumab. <i>J Am Acad Dermatol</i> 2006; 54:68-72	3 adolescent patients with Recalcitrant AD	Benefit when added to the usual therapy

No specific markers found to identify potential responders
Currently, Omalizumab is not indicated for AD

Treatment Strategy for Atopic Dermatitis



**High-potency TCS +/-
wet wrap, Antibiotics
Hospitalization**

**Alt. Rx (Oral Steroids,
PhotoRx, Cyclosporin)**

**Midpotent /Superpotent Steroids +/-
TCI, +/- Topical Antibiotic
Wetwraps
Tar Preparations**

Low Potency CS

Hydration/Avoidance, Barrier Therapies

Proactive Tx w/ Low Potency Topical Steroid or TCIs

Decrease itching H₁ -Antihistamines


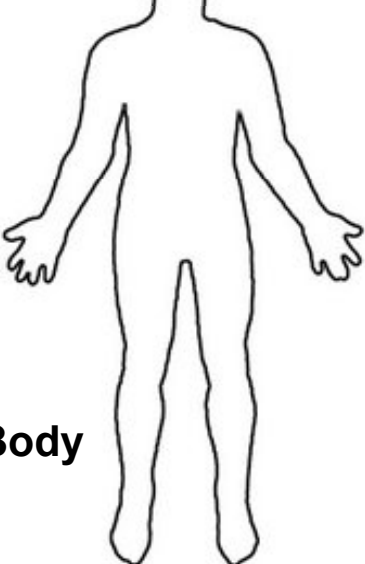
Evaluate for triggers: food, aeroallergens, irritants, microorganisms

Eczema Action Plan

CLEAR

MILD-MODERATE

SEVERE

Face 	AM	Moisturizer*	Moisturizer*:Protopic/ Elidel Hydrocortisone 2.5% oint	Moisturizer*; Hydrocortisone 2.5% oint. Bactroban oint.
	PM	Moisturizer*	Moisturizer*:Protopic/ Elidel Hydrocortisone 2.5% oint	Moisturizer* Hydrocortisone 2.5% oint. Bactroban oint
Body 	AM	Moisturizer* May use Protopic/ Elidel or Hydrocortisone 2.5% oint to small flareups for several days as needed	Moisturizer* Protopic/ Elidel Corticosteroid: _____ Bactroban oint.	Moisturizer* Corticosteroid: _____ Bactroban oint. <i>Call your doctor if not improving after 2 wks</i>
	PM	Moisturizer* May use Protopic/Elidel or Hydrocortisone 2.5% oint to small flareups for several days as needed	Moisturizer* Protopic/ Elidel Corticosteroid: _____ Bactroban oint. Bleach Bath Wet wraps	Moisturizer* Corticosteroid: _____ Bactroban oint. Bleach Bath Wet Wraps <i>Call your doctor if not improving after 2 wks</i>

1. Frequently moisturize: Use fragrance-free moisturizers* (Vaseline, CeraVe, Aqua-phor, Vanicream, Aveeno, Cetaphil, Eucerin, Atopiclair)
2. Reduce skin irritation: Wear loose-fitting clothing such as cotton blends. Wash clothes with liquid, fragrance-free, dye-free detergent.
3. Keep fingernails short and smooth to help prevent damage due to scratching.
4. Bathe (20-30 min) or shower (5 min) once a day using luke warm water & mild soap (Dove or Cetaphil). Gently pat or drip dry immediately apply moisturizer or skin medication on wet skin.
5. Wet wraps: Pat skin dry after an evening bath. Apply topical medication to affected areas & moisturizer to unaffected areas. Soak dressings (Unna Boots, tube socks, Ace bandages or cotton gloves) in warm water. Squeeze out excess water (wet but not dripping). Cover affected areas with wet dressings, followed by a dry dressing on top (another tube sock, Ace bandage, dry pajamas). Wet dressings should stay in place overnight.
6. Bleach baths _____x/week, to decrease bacteria on skin. Mix 1/4 to 1/2 cup of common liquid bleach (e.g, Clorox) into a full bath tub. Soak in chlorinated water for about 10 minutes. Rinse thoroughly with fresh water at the end of the bleach bath.